CLAIMS

1. A propylene polymer of which the heat of fusion ΔH (J/g) and the melting point Tm (°C) measured through differential scanning calorimetry satisfy the following relationship:

$\Delta H \geq 0.45 \times Tm + 22$.

2. The propylene polymer as claimed in claim 1, which has the following properties (1), (2) and (3):

(1) Its melting point Tm (°C) measured through differential scanning calorimetry is $110 \leq Tm \leq 140$;

(2) The half-value width Th (°C) of the peak top of its elution curve obtained in programmed-temperature fractionation is $Th \leq 5$;

(3) Its intrinsic viscosity $[\eta]$ (dl/g) measured in a solvent of tetralin at 135°C falls between 0.5 and 5.

3. The propylene polymer as claimed in claim 2, of which the melting point Tm (°C) measured through differential scanning calorimetry is $120 \leq Tm \leq 140$.

4. The propylene polymer as claimed in claim 2, of which the melting point Tm (°C) measured through differential scanning calorimetry is $120 \leq Tm \leq 135$.

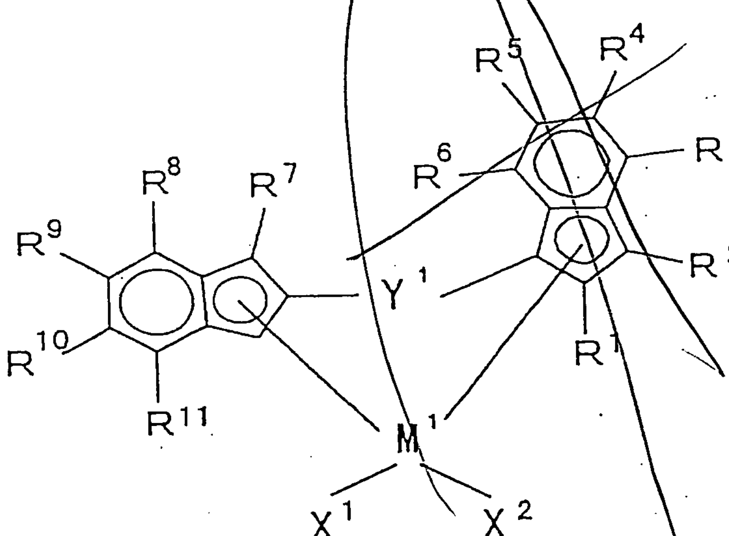
5. The propylene polymer as claimed in any of claims 1 to 4, which is a propylene homopolymer having an isotactic pentad fraction [mmmm] of from 65 to 85 mol%.

6. The propylene polymer as claimed in any of claims 1

to 4, which is a propylene homopolymer having an isotactic pentad fraction [mmmm] of from 70 to 80 mol%.

7. A molding obtained by molding the propylene polymer of any of claims 1 to 6.

8. A method for producing the propylene polymer of any of claims 1 to 6, which comprises polymerizing propylene or propylene with ethylene and/or an α-olefin having from 4 to 20 carbon atoms, in the presence of an olefin polymerization catalyst that contains (A) a transition metal compound of the Group 4 of the Periodic Table represented by the following general formula (1), and (B) at least one selected from (B-1) aluminiumoxy compounds and (B-2) ionic compounds capable of reacting with the transition metal compound to give cations:

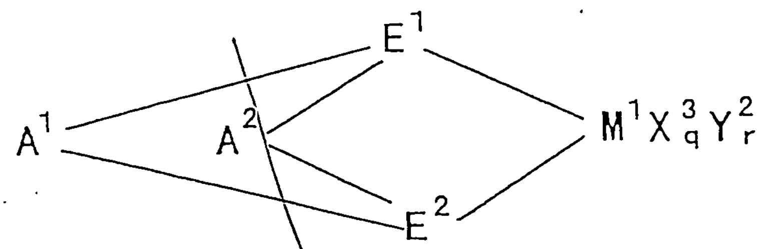


. . . (1)

wherein R^1 to R^{11}, and X^1 and X^2 each independently represent a hydrogen atom, a halogen atom, a hydrocarbon group having from 1 to 20 carbon atoms, a halogen-containing hydrocarbon group

having from 1 to 20 carbon atoms, a silicon-containing group, an oxygen-containing group, a sulfur-containing group, a nitrogen-containing group, or a phosphorus-containing group; R^3 and R^4, and R^8 and R^9 may be bonded to each other to form a ring; Y^1 is a divalent crosslinking group that crosslinks the two ligands, representing any of a hydrocarbon group having from 1 to 20 carbon atoms, a halogen-containing hydrocarbon group having from 1 to 20 carbon atoms, a silicon-containing group, a germanium-containing group, a tin-containing group, -O-, -CO-, -S-, $-SO_2-$, $-NR^{12}-$, $-PR^{12}-$, $-P(O)R^{12}-$, $-BR^{12}-$ or $-AlR^{12}-$; R^{12} represents a hydrogen atom, a halogen atom, a hydrocarbon group having from 1 to 20 carbon atoms, or a halogen-containing hydrocarbon group having from 1 to 20 carbon atoms; M^1 represents titanium, zirconium or hafnium.

9. A method for producing the propylene polymer of any of claims 1 to 6, which comprises polymerizing propylene or propylene with ethylene and/or an α-olefin having from 4 to 20 carbon atoms, in the presence of an olefin polymerization catalyst that contains (A) a transition metal compound of the Group 4 of the Periodic Table represented by the following general formula (2), and (B) at least one selected from (B-1) aluminiumoxy compounds and (B-2) ionic compounds capable of reacting with the transition metal compound to give cations:



· · · (2)

wherein M^1 represents titanium, zirconium or hafnium; E^1 and E^2 each are a ligand selected from a cyclopentadienyl group, a substituted cyclopentadienyl group, an indenyl group, a substituted indenyl group, a heterocyclopentadienyl group, a substituted heterocyclopentadienyl group, an amido group, a phosphido group, a hydrocarbon group and a silicon-containing group, and they form a crosslinked structure via A^1 and A^2, and they may be the same or different; X^3 represents a σ-bonding ligand, and a plurality of X^3's, if any, may be the same or different, and it may be crosslinked with other X^3, E^1, E^2 or Y^2; Y^2 represents a Lewis base, and a plurality of Y^2's, if any, may be the same or different, and it may be crosslinked with other Y^2, E^1, E^2 or X^3; A^1 and A^2 each are a divalent crosslinking group that crosslinks the two ligands, representing any of a hydrocarbon group having from 1 to 20 carbon atoms, a halogen-containing hydrocarbon group having from 1 to 20 carbon atoms, a silicon-containing group, a germanium-containing group, a tin-containing group, -O-, -CO-, -S-, $-SO_2-$, $-NR^{12}-$, $-PR^{12}-$, $-P(O)R^{12}-$, $-BR^{12}-$ or $-AlR^{12}-$; R^{12} represents a hydrogen atom, a halogen atom, a hydrocarbon group having from 1 to 20 carbon atoms, or a halogen-containing hydrocarbon group having from 1 to 20 carbon atoms; and A^1 and A^2 may be the same or different;

q is an integer of from 1 to 5, indicating [(valence of M^1) - 2]; and r is an integer of from 0 to 3.

~~10. The method for producing the propylene polymer as claimed in claim 8 or 9, wherein propylene or propylene with ethylene and/or an α-olefin having from 4 to 20 carbon atoms is polymerized in a vapor phase.~~

~~11. The method for producing the propylene polymer as claimed in claim 8 or 9, wherein propylene or propylene with ethylene and/or an α-olefin having from 4 to 20 carbon atoms is polymerized in the presence of liquid propylene.~~

add B'